

8.—*Notes on South African Non-marine Mollusca.*—By M. CONNOLLY.  
(Continued.)

IV.—*A hitherto unnamed variety of DORCASIA ALEXANDRI Gray.*

IN the Monograph of *Dorcasiinae*, published last year in these Annals, I mentioned on p. 177 a shell from the Erongo Mountains, of which I had then only seen a single specimen, as being probably worthy of a varietal name.

Through the kindness of Messrs. Henry Burnup and John Ponsonby-Fane I have now been enabled to examine an extensive series of this form, collected on Mt. Usakos by Mr. P. Ross Frames, and can thus furnish further particulars.

To Mr. Burnup I am also much indebted for copious notes, whose incorporation in the present paper adds greatly to its value, and reduces my own task to a minimum.



*DORCASIA ALEXANDRI* Gray, var. *MONTANA*, nov. 1916.

Shell depressed-globose, widely umbilicate, rather thin, translucent, Type slightly bleached, pale chestnut above, shading to pale greyish-yellow beneath, peristome yellowish-white. Spire but little raised, though each whorl, in profile, projects clearly above the next; apex obtuse.

Whorls 5, very rounded, rapidly increasing, the 2 apical almost smooth, remainder prettily sculptured above with very fine, close, regular, curved striae, which become much fainter beneath; last whorl descending rapidly in front; suture simple, rather deep. Aperture acuminate-ovate; peristome quite free, continuous, margins not

thickened, reflexed, but not overhanging the umbilicus, which is very wide and deep, extending to and clearly exposing the transparent apex.

Diam. maj. 27·9, min. 22·5; alt. 14·1; apert. 16·2 × 13·0 mm.

*Hab.* DAMARALAND. Mt. Usakos (Frames, 1915). Erongo Mountains (Rogers, 1914). Bullspoort, between Nauchas and Maltahöhe (Tucker, 1916).

At Mr. Burnup's request I have placed the Type in the British Museum.

The chief points in which the new variety differs from typical *alexandri* are in the umbilicus, which is wide and deep instead of shallow and strangulate, and the aperture, which is more acuminate; the sculpture also, though fine and close, is markedly more pronounced than in the typical form.

Both its umbilicus and aperture closely resemble those of *var. perspectiva*, but the sculpture is so distinct that unless intermediate forms are found there will never be any difficulty in differentiating one from the other.

I have selected as Type a shell possessing the double advantage of being the freshest specimen, and also almost exactly intermediate between the two extremes in size, for the latter feature varies greatly, the largest example measuring: Diam. maj. 34·5; min. 28·0; alt. 16·4; apert. 21·1 × 15·6 mm.; and the smallest: Diam. maj. 21·7; min. 17·3; alt. 10·0; apert. 11·8 × 9·7 mm. The average size of the variety, however, would appear to be a little greater than that of the Type, the smaller specimens being in a minority.

The fact of its only occurring, so far, on mountains permits the choice of a distinctive varietal name, but I do not suppose that *montana* will necessarily prove to be confined to mountainous districts, or that such surroundings exercise any influence on the characters of the shell. The Type-set were collected at different altitudes between 300 and 1200 ft., but the size does not appear to be affected by the height. The largest example comes from the 700 ft. level, and the smallest from that of nearly 1200 ft., but there is no average uniformity, as the highest and lowest levels also produce shells only infinitesimally smaller than the maximum.

The aperture is fairly constant in form throughout the series, measuring in four other specimens 19·5 × 16, 16·8 × 14, 16·75 × 14·3, and 14·8 × 12·3 mm.

A series of bleached shells in the South African Museum from the Erongo Mountains present very nearly the same characters as the

Type-set, although the sculpture is not quite so fine, and the peristome shows a tendency to coalesce with the last whorl instead of being perfectly solute.

Since the foregoing was written two bleached examples have been received by the South African Museum from Bulls Mouth Pass (Bullspoot) between Nauchas and Maltahöhe, which undoubtedly belong to the new variety. They differ slightly therefrom, however, in that their sculpture is less pronounced than in the Type; their aperture also is more remote from the umbilicus, so that a considerable expanse of the base of the last whorls is exposed between the umbilicus and the reflexed edge of the peristome.

The shells measure respectively:

Diam. maj. 33·2, min. 26·0; alt. 17·0; apert. 17·9 × 14·7 mm.

„ „ 31·5, „ 24·8; „ 16·5; „ 16·0 × 12·0 mm.

#### V.—On the introduced Land-Molluscan Fauna of South Africa.

I have more than once been taken to task for inserting the introduced species in my Revised Reference List in their natural order instead of sequestering them to some other portion of the volume.

My answer is that not only is it almost impossible to decide, in some instances, whether a species is indigenous or otherwise, but also that I have been often misled, in books where the last-mentioned system prevails, by not noticing or by being unable to find the introduced species: so that I much prefer including them in Generic sequence in the body of the work.

As time goes on, however, it will become increasingly difficult to determine the introduced species, so it may be well to publish a tentative list while it is still possible to collect information from living authorities as to the dates and means of their introduction.

This list combines two distinct groups. One contains, for the most part, large forms whose importation by human agency can be actually verified and whose distribution is even now confined to the most restricted limits of civilisation; the other consists of minute shells, found as often as not in primeval jungle, the date and means of whose introduction, if they were introduced at all, is problematical, and whose diffusion is probably attributable to the agency of birds and winds.

I include Land-slugs and one or two of the *Limnæidæ* in the following list, but omit semi-marine Genera such as *Melampus* and

*Onchidium*, owing to the uncertainty as to their correct identification and the difficulty of determining their original home.

TESTACELLA MAUGEI Férussac (= *T. aurigaster* Layard in MS.).

Taylor \* holds that *aurigaster* Layard is synonymous with *maugei*, and as his views have recently been confirmed by H. Watson † there is no ground for the retention of the former name, a desirable result, since no description or figure of *aurigaster* can be traced and the name is really nude.

*T. maugei* is restricted to Cape Town, and is now becoming fairly frequent in other gardens than those of the South African Museum, in which it was first noticed by Layard. It is peculiarly spasmodic in its appearance, being moderately abundant one season and then allowing several years to elapse before again attracting attention. Its introduction to its South African habitat is easily accountable.

VITREA CRYSTALLINA (Müller).

Only known so far from a few gardens in the neighbourhood of Cape Town and Wynberg, where it has been found locally abundant by R. M. Lightfoot, who first noticed the species in 1890; it has doubtless been imported in soil.

POLITA ALLIARIA (Miller).

Frequent in gardens at Grahamstown, where Mr. Farquhar tells me that he found it in decayed leaves under bushes, fifty yards from his house, when he first went there about 1894.

Its introduction probably dates to a considerably earlier period, for the Grahamstown shells are so much more highly sculptured than typical *alliaris* that they might have been considered a distinct species, were it not that the Rev. E. Wake Bowell has pronounced their anatomy to be identical with that of the European form.

The ordinary smooth variety has existed for at least six years in the greenhouses round the South African Museum, Cape Town.

POLITA CELLARIA (Müller).

Considering that it was noticed by Benson at Rondebosch, where it is now abundant in the woods of Groot Schuur, as long ago as 1846, and was also recorded by Gibbons from the Cape in 1878, it is

\* Mon. Brit. Moll. 1902, pp. 25, 27.

† Ann. Natal Mus. 1915, iii, p. 220.

surprising that this species is not now more widely diffused than is actually the case.

It is pretty general all over the cultivated part of the Cape Peninsula, without, however, encroaching much upon the wilder districts, and it is also recorded from Stellenbosch, Somerset East and Somerset West. The only specimen which I have seen from Bulawayo has the appearance of having travelled there dead in a flower-pot, but Miss Wilman informs me that the species has been observed within the last two years at Kimberley, where it is not infrequent in one or two gardens.

POLITA DRAPARNAUDI (Beck).

Found in nursery gardens by W. J. Oakley about 1908 at Rondebosch, and by myself in 1909 at Kenilworth, C.P., where it is associated with *Z. arboreus* (Say), but is confined to one or two greenhouses, whereas *arboreus* is as happy in the open as under glass.

The Kenilworth examples of *draparnaudi* grow to a large size, my finest measuring 16 × 14 mm. in diameter.

The animal has been examined and identified by the Rev. E. W. Bowell.

ZONITOIDES ARBOREUS (Say).

Shells apparently inseparable from this widespread American species have been collected in nursery gardens at Kenilworth; the Botanical Gardens, Pietermaritzburg; the Zoological Gardens, Pretoria; and at Grahamstown, Queenstown, Kingwilliamstown and Port Elizabeth, to all of which localities it may easily have been transported through commerce.

Of course the presence in the Sub-continent of *Zonitoides africanus* Bttg. and *Z. cupido* M. & P. renders it by no means improbable that other endemic species of this Genus exist therein, and it is really far more remarkable that shells from so many diverse localities should be inseparable from *arboreus* than if they belonged to distinct indigenous species.

KALIELLA SIGURENSIS Godwin-Austen.

Dautzenberg and Germain \* consider the above to be synonymous with *K. barrakporensis* (Pfr.). Whichever name it should bear, this little shell is abundant in many wooded districts up the eastern side of the Continent where it has certainly not been spread by human agency.

Its distribution south of the Zambesi includes the Botanical Gardens,

\* Rev. Zool. Africaine, 1914, iv, p. 17.

Pietermaritzburg, and other Natalian localities in Dargle, Equeefa, Karkloof and Tyeloti, while in the Transvaal it occurs at Fountains, Pretoria, in company with introduced species like *V. excentrica*, *P. oreola* and *L. truncatula*, and on the banks of Hennops River, 15 miles west of Pretoria, where it is hardly likely to have been carried by the hand of man.

In regard to the group of introduced Slugs I can add but little to the bare details given in my Reference List.

Mr. Hugh Watson very kindly permits me to publish a few additional localities from which he has recently received material, with the proviso that they must be accepted for the present as purely conjectural, owing to the impossibility of accurate identification until his anatomical analyses are completed.

#### LIMAX FLAVUS Linné.

Chronicled by Collinge under the name of *variegatus* in 1900 from Cape Town and in 1901 from Natal, where it is said to be common at Pietermaritzburg. Lightfoot writes that he first noticed it at Cape Town in 1898, but has never found it outside the precincts of gardens and outhouses.

A slug that is almost certainly attributable to this species is reported by Watson from Grahamstown (Farquhar).

#### LIMAX MAXIMUS Linné.

Discovered by Lightfoot on Table Mountain, above Newlands, in 1900, and collected by G. French in the same locality in 1913.

#### MILAX GAGATES (Draparnaud).

Date of introduction uncertain, but it was collected near Cape Town by the "Challenger" Expedition in 1873, while Smith\* considers that it may have provided the original material on which Krauss founded his *Limax capensis* in 1848.

*M. gagates* is also recorded from Ashton and Storms Vlei, Cape Province (Purcell), and from Pietermaritzburg.

#### AGRIOLIMAX AGRESTIS (Linné).

Recorded by Sturany from Port Elizabeth (no finder mentioned) in 1898, and by Collinge from Cape Town (Lightfoot) in 1900, and from Pietermaritzburg in 1910.

\* P. Z. S. 1884, p. 276.

Watson considers that specimens collected at Caledon and East London by Mrs. Longstaff in 1914, and at Albert Falls, Natal, by Akerman in 1910, will probably prove to belong to this species. Lightfoot has also taken it in gardens at Stellenbosch, Ceres and East London.

*AGRIOLIMAX LAEVIS* (Müller).

Recorded by Sturany from "Cape" (in Vienna Museum) in 1898, by Collinge from Cape Town (finder not mentioned) in 1901, and by Taylor from Queenstown, Cape Province (Dower) in 1904.

It is probable that examples from Thornville Junction, Natal (Burnup, 1907), will eventually prove to belong to this species.

*ARION FUSCUS* (Müller).

Lightfoot found this species to be fairly common on the slopes of Table Mountain at Plaat Klip, and on Signal Hill, in 1898. It was chronicled by Collinge from Pietermaritzburg in 1910.

*ARION INTERMEDIUS* Normand.

Stated by Simroth to have been collected on the Cape Flats by Schultze in 1904.

In addition to the chances of possible importation by the earlier Dutch and Huguenot settlers, there has more recently been established a considerable German agricultural colony in this neighbourhood, so that the presence there of any of the commoner European Molluscs is easily explainable.

*EULOTA SIMILARIS* (Férussac).

A widespread circum-tropical species whose presence at Durban is doubtless accountable to introduction in plants from Mauritius or Ceylon. It is making little headway in South Africa, for although collected in Durban by Plant about 1860 and in a garden on the Berea, near the Botanical Gardens, by Quekett about 1900, Mr. Burnup informs me that the only fresh locality known to him is in the Stella Bush, near Durban, where specimens have been taken within the last four years. As houses have recently been built abutting on the Bush, *E. similaris* may well have been carried there in plants from the Berea, but it certainly appears probable that the species is now breeding in Natal.

## COCHLICELLA ACUTA (Müller).

I believe that the only South African locality for this Mediterranean species is St. James, Cape Peninsula, where a little colony was discovered by the present writer in 1909 under spare sleepers near the railway station, in company with *P. cellaria*, which found the little helicoids a particularly appetising luxury. Dr. Péringuey courteously informs me that the sleepers have disappeared, but that *C. acuta* is now to be found on *Richardia* (the beautiful white arum, locally known as Pig-lily) in the vicinity of the station.

The sleepers are supposed to have been brought either from Australia or the Knysna forest, which does not account for the introduction of this species, but the shells are remarkably thin and fragile, in great contrast to the solid Mediterranean form.

## PUPISOMA JAPONICUM Pilsbry.

A species inseparable from this Eastern form has evidently been long naturalised in Natal, as it is widely distributed far from the haunts of man, as well as in orchards in the neighbourhood of big towns. The localities given by Burnup are Pietermaritzburg, Edendale, Karkloof, and N'timbankulu.

## PUPISOMA ORCULA (Benson).

This Indian species is still more widely distributed than the foregoing, with which it has been found in all the above-mentioned localities. It has also been identified from Richmond and Dargle in Natal; Port Elizabeth and Grahamstown in the Cape Province; Fountains, Pretoria; and the Rain Forest, Victoria Falls.

## VALLONIA EXCENTRICA Sterki.

Every South African specimen of *Vallonia*, formerly attributed to *pulchella*, which has been subjected to expert examination has proved to belong to Sterki's species.

Although first found by Benson at High Constantia as long ago as 1846, it does not appear to have travelled far from civilisation, its distribution being confined to the near vicinity of large towns, and easily attributable to quite a mild tornado of that peculiarly dusty type which adds so little to the doubtful charms of life on the veldt. Thus it is found at Fountains, Pretoria, where original bush is inter-



spersed with patches of cultivation, in common with the introduced *P. orcula*, *K. sigurensis*, and *L. truncatula*, as well as the endemic *Trachycystis hottentota* M. & P.; but in the Cape Peninsula, while *hottentota* inhabits the little piece of apparently original jungle in the Admiralty Ravine, Simonstown, *excentrica* has not spread beyond gardens in Cape Town and Wynberg.

Its other localities are Somerset East, Grahamstown, Kingwilliamstown and Port Elizabeth in the Cape Province, and Pietermaritzburg in Natal.

#### HELIX ASPERSA Müller.

The late Lord de Villiers informed me that he remembered this species being first brought to Cape Town by Mons. Dastre for eating purposes about 1870. The rapidity with which it adapted itself to its new surroundings is evinced by the fact that it was one of the only three land-molluscs collected in that neighbourhood by the members of the "Challenger" Expedition in 1873, while Gibbons wrote in 1878 that he had never seen the species so plentiful as it then was in the neighbourhood of Cape Town.

Outside the Cape Peninsula and Robben Island *H. aspersa* is only known from Port Elizabeth, where Mr. Farquhar found it not uncommon as long ago as 1882, and from Kimberley, where Miss Wilman informs me that it made its first appearance in gardens in 1915.

#### HELIX FAUX-NIGRA Chemnitz.

Pallary\* has shown that Müller's original description of *Helix lactea* cannot possibly be applied to the well-known Mediterranean species, which must pass in future under the hideous, though appropriate, name *faux-nigra* of Chemnitz.

Two examples of this species were found by Mrs. Barber in 1897 in a garden on the bank of the Kowie River, where it does not appear to have perpetuated itself. The erroneous record of Pondoland in Melville and Ponsonby's Check-list refers to this occasion.

As the shells are no longer in existence it may be worth remarking that they were of the dark, bandless variety, such as is frequent at Teneriffe, a port of call for nearly half the traffic between Europe and the Cape.

#### HELIX PISANA Müller.

This species was first noticed by W. G. Fairbridge in 1881 on what was then Gallows Hill, but now forms part of Cape Town Docks.

\* Nachrichtenbl. d. D. mal. Ges. 1914, p. 8.

It is now by far the commonest shell in the Cape Peninsula, where I believe it has caused the extinction of at least one native form, *Trachycystis variplicata* Bs., for which I have often searched at Green Point, its sole locality, without unearthing anything more interesting than thousands of the European species.

From Cape Town *H. pisana* has spread across the Flats to Somerset West and Gordons Bay, and as far inland as Stellenbosch, while within the last thirty years it has become extremely plentiful at Port Elizabeth and in the Gamtoos Valley.

It was first noticed at Durban on sand-hills near the lighthouse in August, 1905, by Dr. Longstaff, and at East London in November, 1915, by R. M. Lightfoot, who rightly points out that its presence in the three last-mentioned localities is more likely to be due to separate introductions than to spreading of the species.

#### LEUCOCHILOIDES CALAHARICUS (Böttger).

Even if the above is identical with such as *senegalensis* Morelet, or *fallax* Say, it can hardly be classed as an introduced species until the original home of this world-diffused form is determined. South African localities are: Jansenville; Prieska; Taungs; Hay District; Ghous; Bullsport; near Schlip in Damaraland; and the Victoria Falls.

#### ACHATINA AURORA Pfeiffer.

There can be little doubt that the beach-rolled singleton which constitutes this species was neither born in Durban nor ever entered that port alive, but until it can be definitely identified with one of the equatorial forms it is impossible to determine its true habitat.

#### ACHATINA FULICA (Férussac).

It is rather remarkable that this common East Coast and Mauritian species has not secured a wider footing in South Africa, the only known instance of its incursion being a half-grown specimen, which was captured in a Durban garden near some tins containing Crotons from Mauritius, and presented alive to Mr. Burnup about 15 years ago.

#### CÆCILIOIDES ACICULA (Müller).

Widely diffused, though infrequent, throughout the continent, apparently quite inseparable from the European form. I have found

it in gardens at Wynberg, where it was very probably introduced direct in soil from England, and in the Bushveldt in the Northern Transvaal, where it is most unlikely to have been deposited by human agency. Other recorded localities are Bloemfontein, Prieska, Cradock and Kimberley, to which may now be added Grahamstown (Kincaid and Farquhar) and Macequece District, Portuguese East Africa.

I have little doubt that *C. advena* Ancy, from Disappointment Vlei, Ovampoland, and *C. ovampoënsis* M. & P., described from Ovampoland and recorded by Sturany from Matolla, near Delagoa Bay, are synonymous with *C. acicula*, but no authentic example of *advena* can be traced, while the Type-set of *ovampoënsis* is now in hardly sufficiently good condition to admit of accurate comparison.

#### SUBULINA OCTONA (Bruguère).

A shell attributed to this circum-tropical species is common at the Victoria Falls. As it is recorded by Pilsbry from both the East and West Coasts of Africa its occurrence in the centre is not unnatural. Pilsbry remarks: "It is generally and I believe correctly held that this species in the tropics of the Old World is an emigrant from America. It appears first to get foothold in centres of trade and agriculture and to spread with extraordinary rapidity into neighbouring districts" (Man. of Conch. xviii, p. 74).

#### RUMINA DECOLLATA (Linné).

As mentioned in my Reference List, there is no evidence that the two examples of this species which were found at Port Elizabeth in 1897 were imported in other than dead condition. They have recently been secured for the collection of the South African Museum.

#### LIMNÆA TRUNCATULA (Müller).

The species named by Küster *L. umlaasianus* and placed in the above synonymy by Bourguignat is by no means common in South Africa, being only recorded from the Umblaas River, Natal; Fountains, Pretoria, and Stellenbosch.

#### PLANORBIS GIBBONSI Nelson.

As this species was described from Zanzibar its occurrence in the Black River, Maitland, where it was first found in 1910, might appear to be due to human aid, but as it has since turned up in the Congo

Free State and subfossil in a second South African locality, Newlands, near Kimberley, it may well be endemic to a great part of South-equatorial Africa.

ISIDORA CONTORTA (Michaud).

Although included in my Reference List, it is a little doubtful whether the truly typical form of this northern species exists south of the Zambesi, or whether the slightly immature examples from Grahams-town, which I have attributed to it, might not have developed into *I. tropica* (Krauss). The latter is, in my opinion, merely the southern race of *contorta*, a variable species from which not only *tropica*, but several other named forms from various parts of the continent are hardly varietally separable.